that in 1847 England was behind America must surely be wrong. The Electric Telegraph Company in England was then in full swing.

As this is the jubilee year of the telegraph in England, it is well to be reminded that Cooke and Wheatstone made their first practical and successful trial on July 25, 1837, between Euston and Camden, while Morse did not file his *caveat* (*i.e.* did not apply for his patent) until October 5 of the same year.

We wish the book every success, and shall be glad to see further instalments.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Normal School of Science and Royal School of Mines

I AM directed to request that you will be so good as to allow me to state, through the medium of your columns, that the number of applications for admission to the Normal School of Science and Royal School of Mines at South Kensington, at the commencement of the present session, having been considerably in excess of the accommodation which the School can afford, it has become necessary to adopt some process of selection for the future. Hereafter, applications for admission should be sent to the Registrar of the School before the end of May, accompanied by a statement of the studies which the applicant has already pursued, the examinations he has passed, and the name of a teacher (or teachers) to whom reference may be made. Such applications will be considered by the Dean and Council of the School, who will decide on them according to their merits. A knowledge of elementary mathematics, such as is required of all Royal Exhibitioners and national scholars, will be held to be of the first importance for those who desire admission to the course for the Associateship of the School; while for occasional students, who propose only to take up certain specific branches of science, some preliminary knowledge of them will have weight.

J. F. D. DONNELLY

Science and Art Department, January 14

The Cambridge Cholera Fungus

THE letter published by Dr. Klein in your issue of December 23 (p. 171) having incidentally referred to my views as to the nature of the fungus present in choleraic tissue, I should be glad to be allowed to make some further remarks upon the subject.

At an early stage of his investigation Prof. Roy brought for my inspection one of his preparations of intestinal mucous membrane, which clearly demonstrated the presence of certain foreign organisms, and especially drew my attention to a form which he took to be the more usual and typical one. Such a structure might perhaps best be described as consisting of a thin and somewhat moniliform filament which at one end exhibited a distinct nodular swelling. Being struck with a certain (and, as I now fear, a somewhat superficial) morphological resemblance to a group of the Chytridiaceæ, I suggested that the organism might possibly be a Chytridium, and this view was perhaps too confidently adopted by Messrs. Roy and Sherrington in their paper. The appearance of Dr. Klein's letter has naturally led me to carefully reconsider the whole question, and on further consideration I entirely abandon the idea of the organism being a Chytridium. I believe, on the contrary, that it is a Bacterium, and that the structure described by Prof. Roy and seen by myself is that particular phase in the life-history of the Bacterium which is known as an involution form. Such forms are described, for instance, in Zopf's article "Die Spaltpilze," in Schenk's "Encyclopædie der Naturwissenschaften," as *Bacterium aceti* and *Bacterium cyanogenum.* Indeed, the involution form assumed by the latter Bacterium recalls very vividly to my mind the structure shown to me by Prof. Roy.

In conclusion, I may assure Dr. Klein that the fungus is certainly neither a Penicillum nor of the nature of a mould, and that I do not believe it is in any way associated with *post-mortem* change.

WALTER GARDINER

Royal Gardens, Kew, January 11

Snowstorm of January 7, 1887

A MOST extraordinary snowstorm occurred here to-day (January 7). In fifty years' experience I have seen nothing like it, nor has anyone else in this neighbourhood seen any similar phenomenon. It would be impossible to realise the gigantic size of the snowflakes without seeing them. I can only compare them to a fall of oranges, though the diameter of an orange would be small in comparison with thousands of these snowflakes; in this immediate neighbourhood (*i.e.* within sight of the place of observation) at 50 yards off it produced a dense snow-wall. The wind was south, and almost calm, and the largest snow came down nearly perpendicularly. The temperature was 32°·6, and the air completely saturated with moisture. Before the storm the temperature was 34°·1. Snow had been falling with a slight thaw from 10 a.m., the snowflakes being small. Suddenly, at 12h. 12m. p.m. they became 2½ inches in length;[1] at 12h. 14m. they had increased to 2¾ inches; and one flake that was caught measured 2¾ inches by 2½ inches, and was $\frac{3}{10}$ of an inch thick. At 12h. 16m. the flakes had increased in size to 3½ inches (and several measured were 4 inches across, and there were several larger ones not near enough to be caught); at 12h. 19m. they were somewhat less, and at 12h. 20m. though large, were not gigantic. Fortunately I was measuring and weighing snow at the time, with two assistants, and had a number of flat circular glasses kept cold ready for the purpose of catching crystals, and for measuring the snow that fell upon these glasses. As is usual when very large flakes are falling, there were many of smaller size, though when the flakes were from 2½ to 3½ inches, the majority of the next size were about 2 inches, and the very large flakes would be within 12 inches of each other. A dozen of these large flakes were caught, each on a separate piece of glass, measured and removed under cover, my two assistants giving valuable aid. Of three of these flakes one yielded 14 drops of water, a second 15, and a third 16 drops; and these were not the largest flakes seen.[2] The water from seven flakes weighed a quarter of an ounce within 2 or 3 grains. The weight of ten varied from 13 to 16 grains each; most of the flakes were about a third longer than broad, one flake that was 3½ inches long by 2½ broad was estimated (before it touched the glass) to be 1½ inch thick, when flattened by the force of its descent it was ¼ of an inch thick.

The flakes were not a mass of broken pieces, but were composed mainly of perfect crystals, and there must have been hundreds of these crystals in each flake; they were clinging together at every conceivable angle, though a much larger percentage were more horizontal than vertical. A terrestrial radiation thermometer, buried a fifth of an inch within this snow, marked a temperature of 32°·4.

The snow which fell during the last six minutes of this great storm was just under one-fifth of an inch in depth, and yielded ·030 of an inch of water, falling at the rate of 1 inch of water in three hours and twenty minutes (yielding 1 inch of water from 6 inches of snow).

There was a great snowstorm here on December 27, 1886, which varied considerably in places near to each other, *i.e.*—

	Amount of rain and snow	Depth of snow Inches	Melted snow alone
Shirenewton Hall	1·55	7	0·97
Dennil Hill	1·07	5	0·71
Wirewoods Green	0·86	3	0·42
Piercefield Park	0·96	4	—
Chepstow (The Mount)	0·70	—	—

The drifts above here are very great, and a large number of men are still engaged in cutting through them.

The following measurements will show the number of inches

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[1] The breadth was less than the length, and the thickness less than the breadth; more or less flattened, and curled over on the edges.

[2] Besides these drops, the wetted glass shall count for two more drops.

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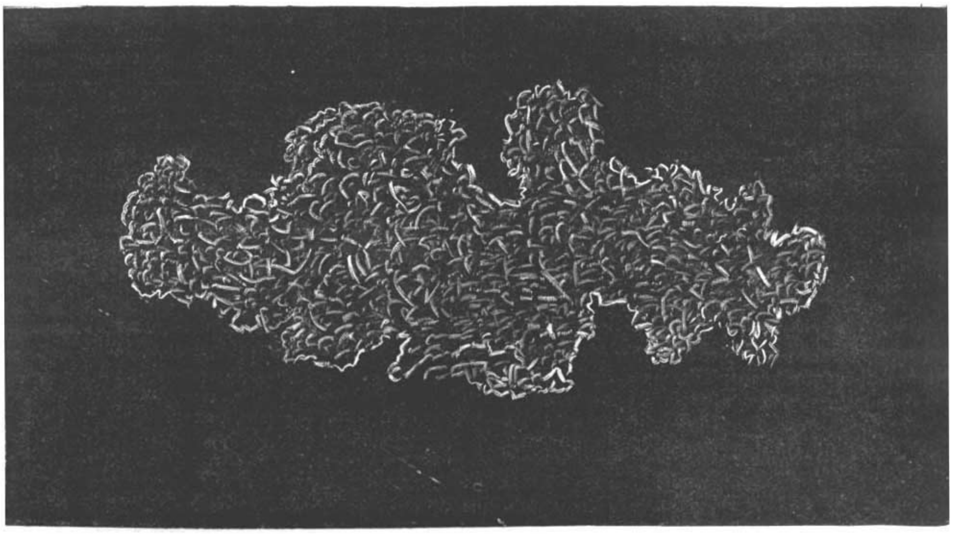
of snow required to yield an inch of water from observations taken here :—

1886, January 23, snow 2 inches, melted ·063 (*i.e.* 33 inches for 1 inch of water) ; March 1, snow 7 inches, melted ·800 (*i.e.* 9 inches for 1 inch of water) ; December 26, snow 7 inches, melted ·967 (*i.e.* 7 inches for 1 inch of water). 1887, January 4, snow 3¼ inches, melted ·379 (*i.e.* 8½ inches for 1 inch of water) ; January 7, ⅕ inch, melted ·030 (*i.e.* 6 inches for 1 inch of water).

The damage done on December 26 was unusually great, the snow being very heavy, as much as 5 lbs. weight on a square foot of a cedar-branch ; this, when moved by the wind, caused much breakage.

January 8.—Since sending my note yesterday I find that at Chepstow and at Itton the snowflakes were larger than anyone had before seen, so that probably the storm had an extended area ; at all events it was 5 miles broad.

The present storm is a very similar one to that recorded by myself in January 1838, except that the largest flakes in 1838 did not exceed 2 inches. In that storm the largest flakes fell more rapidly and more perpendicularly. I then pointed out that large snowflakes were produced by two upper currents driving the flakes together ; and afterwards, by the largest falling with increased velocity and more perpendicularly : they were thus able still more to augment their dimensions by adding smaller ones to their bulk. This was well seen on January 7, when an estimate was made as to the velocity and angle of their descent. Not only were a number seen to be added as they fell upon them, but it was thought that small flakes when near to the large ones were attracted to them. The flakes were, however, large whilst at a considerable distance from the ground.



Shape and size of snowflake. (There were more of a somewhat similar form to this than the more circular ones, though there were very many more circular and less indented.)

Several flakes were sketched before they began to melt, and one of the sketches is sent as an illustration. The glasses were at a temperature of freezing, and therefore it was some time before the snow melted, and not thoroughly so until they had been 5 minutes in a hot-house.

January 13.—The snowflakes folded over on the edges, boat-like, and this curling over caused the thick look observed. There was a slight zigzag in their downward course of some 2° or 3°. This storm passed over Chepstow, Itton, and Monmouth in this county ; Wirewoods Green, Tidenham, and Dennil Hill, all in Gloucestershire, and Bath : in all of these places the flakes are spoken of as the largest ever seen. One correspondent at Chepstow reports them as larger than the hailstones in the storm of May 1848, which were larger than hens' eggs, and broke the shop windows, and destroyed the glass of hot-houses near Chepstow. E. J. LOWE

Shirenewton Hall, near Chepstow

Auroras

THE account, in NATURE for December 16 (p. 159), of a bright cloud "emitting brilliant rays of light," that suddenly appeared at Hamar, in Norway, on the night of November 3, recalls the fact that on November 2 there was at Lyons, New York, an aurora which at one time during the evening consisted entirely of detached luminous clouds, as was noted in NATURE for November 18 (p. 54). It is stated that on November 4 one of the finest auroras of the year was visible at Throndhjem, Norway. M. A. VEEDER

Lyons, N.Y., January 3

A Solar Halo

IN the weather report issued on Friday evening, the 14th inst., a solar halo is recorded as "observed in Jersey during the day." Between noon and 12.30 I observed a very complete and well-defined halo, of radius about $\pi/8$, in this neighbourhood. It was not perceptibly tinted, but the duskiness of the interior, as compared with the clear sky exterior to the luminous ring, was more pronounced than I ever remember to have noticed it on other occasions—so much as to suggest comparison with the "curtain" of the aurora : "Solem quis dicere falsum audeat !" J. J. WALKER

Hampstead, N.W., January 15

THE NATIONAL SCIENCE COLLECTIONS[1]

II.

25. REVERTING to this country, the "Patent Museum," now under the charge of the Science and Art Department, is a collection of a peculiar nature ; and in order to explain its origin, and the objects it was intended to serve, we may make some extracts from the Report of a Select Committee of the House of Commons, appointed in 1864, to inquire as to the most suitable arrangements to be made respecting the Patent Office, Library, and Museum. The Committee said :—

> The second point to which your Committee directed their attention was that of the Patent Museum, having regard especially to its formation, its present state, its relation to the Patent Office and Library, and the nature of its contents, so as to render it practically useful.
>
> Your Committee found that the Patent Museum was formed by Mr. Woodcroft, the Superintendent of Specifications, by the request of the Commissioners of Patents, and that it consists of models and machines belonging partly to the Commissioners of Patents, partly to the Commissioners of the Exhibition of 1851, and partly to Mr. Woodcroft himself, and various private persons.

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[1] Continued from p. 254.

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